

MARINE REVIEW.

VOL. VII.

CLEVELAND, OHIO, THURSDAY, APRIL 27, 1893.

No. 17.

Ore Sales Market—Lake Freight Matters.

About twenty vessels in all have been chartered in Cleveland during the past few days for a first trip from Escanaba with ore at 65 cents. They are in nearly all cases vessels loading coal or already bound to Lake Michigan ports with coal cargoes. It has been claimed that a few boats chartered at Milwaukee were put in at 60 cents, but this is not a question of importance, as there is no further immediate demand for tonnage at any figure, and grain rates at Chicago have reached a one-cent basis. In addition to this demoralized condition of opening rates on cargoes to come down the lakes, the demand for coal tonnage at Buffalo has fallen off materially, and at Ohio ports an effort on the part of shippers to reduce the Lake Superior coal rate would very probably be successful. All this depression is due primarily to the wheat corner at Chicago and to the failure of ore producers to agree upon prices with their customers, while the immediate cause is the unexpected early opening of navigation, which resulted in a rush of almost the entire lake fleet to Lake Michigan. Then, too, Buffalo coal shippers were unprepared for the arrival of the grain fleet before May 1, and a strike now threatened among the soft coal miners of Ohio and Pennsylvania is among other complicated features of the situation. These are facts covering conditions that have brought about an astonishing state of affairs in lake freights within a very short period, but without attempting predictions it can be said truthfully that the depression has not shaken greatly the opinions of vessel owners as to a profitable business as soon as these extraordinary conditions are removed. Concessions on previous figures would undoubtedly be made now on ore business running through the season, the low range of opening freights acting as the greatest kind of a drawback to all interests concerned, but sales of ore are still delayed, and the speculators in control of the grain are also conducting their affairs in a manner decidedly detrimental to the vessel owners. The ore shipper seems to have more to fear than the vessel owner, however, as he can not, even with the present depression, adjust the lake freight situation so as to meet the possibility of being forced to sell the best grades of ore at \$3.50 a ton.

Survey Work on the Lakes.

Through appropriations secured recently for the correction of lake charts, and for the distribution of information relative to improvements in the harbors, channels and navigable tributaries of the lakes, the army engineer corps will do considerable survey work during the coming summer. From the office of Gen. Poe, Detroit, we have received a bulletin which contains information supplemental to that given upon the charts. This additional information in pamphlet form will be issued in future with the charts from the office of Gen. Poe, and can also be had from any of the members of the engineer corps in lake cities.

Lieut. Charles S. Riche, who is connected with the Detroit office and has been conducting a part of this scientific work, says in a letter of recent date from Sault Ste. Marie: "Considerable survey work is contemplated on St. Mary's river during the coming season. We shall attempt to connect the primary triangulation of Lake Superior with that of the straits of Mackinac, and, while it is not likely that the entire connection can be made, we expect to do a great part of it. We are now engaged in astronomical observations to determine latitude and longitude of a point in Sault Ste. Marie and are just beginning to start out some of the field parties for the summer work. We will make

an effort to get enough field work done for at least one new chart if it is possible. So far little else than preliminary work has been done. After July 1, however, when the new appropriation becomes available we will probably have quite a force in the field. The work contemplated is with a view to getting out new charts for the distance from Whitefish point to Detour, where, it seems to me, new charts are a great necessity."

Fog Signal for Sailing Vessels.

Again there is handed down from the highest admiralty court a decision bearing upon the kind of fog signal to be used by sailing vessels. The case, which was that of Gould et al. vs. Boston and Philadelphia Steamship Company, was recently decided by the federal circuit court of appeals at Boston, and arose upon a libel for damages for the loss of the schooner Florence and her cargo of ice, freight and personal effects of the crew, caused by a collision with the steamer Parthian, which occurred July 16, 1890, near Sandy Hook in a fog. The court below found that the schooner was solely at fault in using as a means of signaling a mechanical steam whistle not sanctioned by the sailing rules established by congress. The circuit court of appeals said that by the regulations of congress a sailing ship, whether a steamer for the time being only under sail or vessel having only sails as her means of propulsion, must give her signals by a fog horn, and is not permitted to make use of any steam whistle or other steam sound signal reserved for the exclusive use of steamships; that the Florence did not have the means for giving a sound signal prescribed by the act of congress, and that her owners could not be permitted to say she had something better. The court, however, held that the high rate of speed at which the Parthian was going at the time of the collision, when there was a fog, was negligence and contributed to the collision, and that the damages should be divided equally between the two vessels.

Register of Shipping.

THE MARINE REVIEW has received a copy of the United States Standard Register of Shipping, 1893-4, containing rules for the construction and classification of iron, steel, composite and wooden vessels, twenty-two pages being devoted to rules and drawings for lake vessel construction. Detail of required equipment is given and names of vessels classed with owners' names and lists of builders and underwriters making up the officers of the association. It is published by the United States Standard Steamship Owners Builders' and Underwriters' Association, 16 and 18 Exchange Place, New York. A review of the lake rules is reserved until they can be given further consideration.

Lumber Outlook.

A letter from Duluth says of the great demand for lumber: "In all the Duluth district with its cut last year of 350,000,000 feet, there is practically no lumber on hand, except what may have been sorted out and held for a particular trade. Not only this, but there has been sold in Duluth and its immediate vicinity, to the eastern buyer not far from 75,000,000 feet of the cut of the coming season, the logs for which cut are still in the woods or on the rivers. What dry lumber is to go out early in the season, both by rail and lake, will make scarcely any figure in yard accumulations, as it, too, is well sold ahead."

Record of Speed and Big Cargoes.

[*Masters or owners of freight boats are invited to report improvements on this list.*]

Iron ore: Maritana, Minnesota Steamship Company of Cleveland, 4,260 gross or 4,771 net tons, Escanaba to South Chicago; Maryland, Inter-Ocean Transportation Company of Milwaukee, 3,663 gross or 4,103 net tons, Escanaba to South Chicago, draft 17 feet 4 inches.

Grain: Selwyn Eddy, Eddy Transportation Company of Bay City, 139,200 bushels of wheat, Detroit to Buffalo; E. C. Pope, Eddy Transportation Company of Bay City, 125,730 bushels of corn, Chicago to Buffalo; Onoko, Minch estate, Cleveland, 187,657 bushels of oats, Chicago to Buffalo.

Coal: E. C. Pope, Eddy Bros. of Bay City, 3,950 net tons anthracite, Buffalo to Chicago.

Speed: Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour.

Buffalo Port Matters.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., April 27.—It is a trifle disappointing to find that the big Chicago grain charters are inclined to run short. Winter cargoes overrun as a rule, but if Chicago sends us short cargoes now, what will she do when they have not been held long enough to gather weight by dampness? Spite of the outcry that often goes up against short cargoes from Duluth, tallymen tell us that Chicago is the greatest sinner in this respect.

The report of the steamer Ohio, an almost total wreck at Detour last Monday, when everybody supposed she was safe with her coal cargo in Chicago, shows that human calculations are poor stuff to build on. Capt. Robert Evans was mate of her last year and was reckoned one of our best masters. He was greatly liked personally. The Ohio made the Chicago opening coal rate and went out with the best promise of a safe trip just a week before she was discovered a wreck.

Notwithstanding the cloud over marine matters, spread by the terrible disasters of last week, Monday was something of a red letter day here. The new Gratwick came down from Bay City with Capt. John Mitchell, her manager, and F. W. Wheeler, her builder, to show her to the crowds that came on board, and Capt. John Shaw was here to look after the Selwyn Eddy. He is delighted with her behavior down from Detroit, which she made in twenty-one hours. She promises to outsail the Pope and she already handles quite as well.

There is every indication of a lively scrap between the lumber shovers union and the stevedore gangs as soon as the Tice tow begins to discharge its cargo. The lumbermen have felt obliged to lock out the union because of their obnoxious conduct last season, but they do not propose to be locked out. As Buffalo is better calculated to put down a disturbance than Tonawanda, the arrangement to send the first barges here was purposely made. After the issue is met in this way part of the Donaldson tow will be sent to Tonawanda.

The ruthless scattering of the Chicago grain fleet by the storm has so prolonged their trip down that there is as yet no rush for elevator accommodation, though grain has been coming in here for more than a week. The unexpectedly early opening of navigation is, however, evident in this branch of business as well as in up-bound shipments.

Sault Canal Draft.

Special Correspondence to the MARINE REVIEW.

SAULT STE. MARIE, Mich., April 27.—For the first half of April the record of water levels above and below the lock shows the following draft:

Date.	1892.		1893.	
	Above Lock. Ft. In.	Below Lock. Ft. In.	Above Lock. Ft. In.	Below Lock. Ft. In.
April 1.....	12-1	13-9	13-5	14-7
" 2.....	12-7	13-8	12-2	14
" 3.....	13	14-1	12-8	14-1
" 4.....	12-7	14-1	13-5	14-7
" 5.....	12-1	13-9	12-8	14-2
" 6.....	11-9	14-2	12-8	14
" 7.....	11-7	13-8	12-7	13-8
" 8.....	13-2	13-9	13-3	14-3
" 9.....	13-5	13-8	12-8	13-9
" 10.....	13-5	13-9	13-3	14
" 11.....	13-2	13-7	12-7	13-9
" 12.....	13-1	13-6	13-1	13-8
" 13.....	13-2	13-6	13-7	14-3
" 14.....	13-6	13-4	13-6	14-2

This shows a draft of water about equal to the opening draft last season.

The Ship Question in Canada.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., April 24.—The Richelieu & Ontario Navigation Company purposed registering their new Baltimore, Md., purchase, the steamer Carolina, in Canada, believing they would not have to pay duty. But there has been no change in the law to warrant this course. The company will have to register under British laws at St. Johns, Newfoundland, if duty is to be escaped, and they will do so. It is said that when the Dominion government brings down its tariff reform measure next session, it may amend the customs

laws so as to enable vessels bought outside the dominion to be registered duty free, but it is probable that such a clause would be very much opposed by the shipbuilding concerns of Canada. They want their business protected.

The ship chandlers here are complaining at the laxity of the customs officers. Vessel owners purchase tackle and other supplies in United States ports and seldom pay duty on the stuff when they return to Canada, and in this way Canadian dealers are euchred out of much trade. They are asking that the customs officials watch the matter closely.

Inventions of a Marine Nature.

Specially reported from Washington for the MARINE REVIEW.

495,494—Device for raising sunken vessels, by John T. Kelly of North Fitzroy, Victoria; filed Nov. 22, 1892; serial number 452,846.

495,549—Collapsible and folding boat, by William H. Gamble and David H. Allen of Miamisburg, O.; filed Oct. 17, 1892; serial number 449,145.

495,587—Ship's log, by Charles F. Holt of New London, Conn.; filed July 22, 1892; serial number 441,108. An electric speed indicator with registering apparatus is connected with a submerged drag.

495,622 and 495,623—Steering mechanism, by Jorgen Christensen of San Francisco, Cal.; filed April 9, 1892; serial number 428,430.

495,727—Ship's propeller, by Alfred T. Elford of San Francisco; filed Aug. 22, 1892; serial number 443,716.

495,804—Apparatus for moulding propellers, by Louis Hix of New York City; filed April 26, 1892; serial number 430,762.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on April 15, 1893:

	Wheat, bu.	Corn, bu.
Chicago.....	18,164,000	4,402,000
Duluth.....	16,869,000	341,000
Milwaukee.....	1,977,000	11,000
Detroit.....	1,689,000	33,000
Toledo.....	3,637,000	938,000
Buffalo.....	2,077,000	241,000
Total.....	44,413,000	5,966,000

At the points named there is a net increase for the week of 668,000 bushels of wheat and a decrease of 1,123,000 bushels of corn. In addition to the above stocks, there was afloat in lake-vessels at Duluth 571,000 bushels of wheat.

Gross I. H. P. of one 40-inch Cylinder.

In doing some figuring as to the horse power which could be developed by a triple expansion engine on a high speed twin-screw steamer, I made up a table having the gross indicated horse power under various effective pressures and with different piston speeds. The low pressure cylinder was nearly 40 inches in diameter, having an effective area of practically 1,200 square inches, and as this cylinder, under the mean effective pressure which could be due to the entire expansion to take place in that cylinder, would measure the capacity of the engine, I have with it as a basis figured the gross indicated horse power, as shown in the accompanying table:

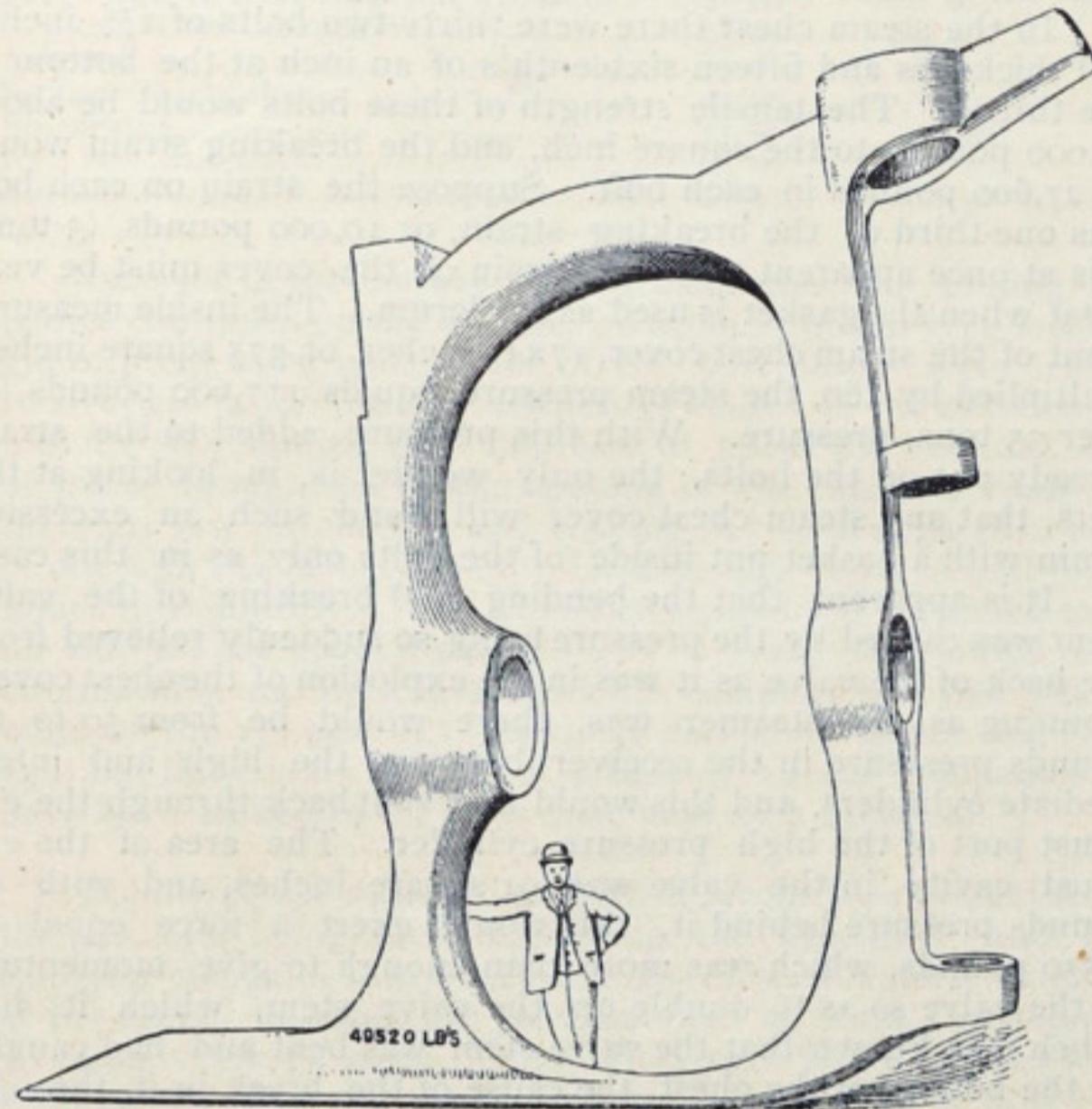
M. E. P.	PISTON SPEED, FEET PER MINUTE.					
	500	600	700	800	900	1000
10	182	218	254	291	327	364
15	278	327	382	436	491	545
20	364	436	509	582	654	727
25	455	544	636	727	818	910
30	545	654	764	872	981	1090
35	637	762	891	1018	1145	1272
40	727	872	1018	1163	1309	1454
45	881	980	1145	1309	1472	1627
50	910	1088	1272	1454	1632	1820

The horse power at high piston speeds, such as 900 and 1000 feet per minute, are given because these afford convenient basis for calculating the powers at other and lower speeds, such as 450, 425, etc.—R. G. in Chesapeake Marine Gazette.

Mr. L. R. Doty and his associates in the bituminous coal business, who have met with financial difficulties through the failure of A. G. Yates, of Rochester, were engaged extensively in the lake shipping trade. They have the sympathy of vessel owners, on account of the unfortunate circumstances involving them in the failure.

Big Steel Castings.

Builders of merchant ships, and especially those of the lakes, where sixty keels have been laid since last September—more than half of them steel—will be interested in the progress being made in the navy with big steel castings. The engraving represents an open hearth cast steel stern post just completed by the Standard Steel Company of Thurlow, Pa., and shipped to Philadelphia for the cruiser Columbia, now in course of construction



by the William Cramp and Sons Ship and Engine Building Company. It is claimed that this is the largest steel casting ever made in this or any other country. The casting is in one piece and weighs 49,520 pounds. The same company has contracts for stern posts for the new war ships Iowa and Brooklyn, also to be built by the Cramps, and it is estimated that the weight of each casting will be more than double the weight of the one just completed. The engraving is taken from the Iron Age.

The casting shown in the engraving is about the size of wrought iron frames used on lake steel vessels, but the shape is, of course, a little more complicated. On account of the length of frames used on the lakes and the simplicity of shape, the forge companies have made prices just within a limit that has given to them all of the work, but there is a disposition among some of the builders to favor the steel casting companies if possible, in order to create competition, and it would not be surprising if steel castings of the kind referred to are introduced here shortly.

Tool for Caulking, Chipping or Riveting.

A new portable power apparatus for caulking, chipping or riveting, invented by Mr. J. M. Ross, of the firm of R. G. Ross & Son, Glasgow, has been adopted by several Clyde engineering firms with most satisfactory results. The new tool consists externally of a tapering metal case having a handle at the larger end and a socket for holding the working tool at the smaller extremity. Inside the case is a liner cylinder containing the working piston, which is of solid forged steel and duplex in form, being practically two pistons connected by a distance-piece of rather smaller diameter. By an ingenious arrangement of passages and ports the working fluid, which may be either compressed air or steam, is made to impart the necessary rapid vibratory movement to the piston without the employment of any valves, the piston itself opening and closing the ports at the right intervals. As the tool works equally well with air or steam, it is independent of costly compressing machinery, and may be used in any place where a steam pressure of from 40 to 60 pounds is available.

Buffalo Marine Engineers' Beneficial Association.

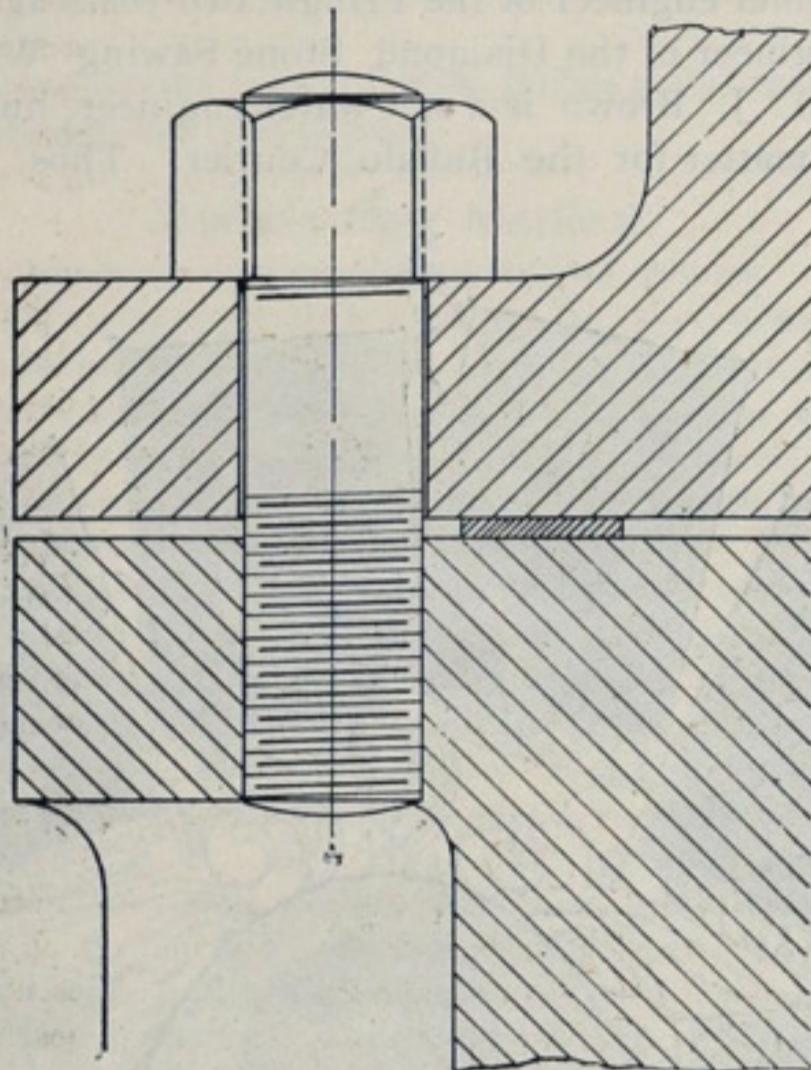
The Buffalo association, the officers of which are shown in the accompanying cut, recently issued a very handsome directory containing, in addition to the names and addresses of members, a great deal of information valuable to engineers. The faces shown are quite familiar, and a little information as to their berths and present location will be interesting: Past President Miller has been in the Western Transit line fifteen years and is now chief engineer of the Chicago. The last sailing that President Lance did was as chief engineer of the Pringle two years ago. At present he is engineer of the Diamond Stone Sawing Works. Vice President D. J. Brown is a salt water engineer, but now turns out printed matter for the Buffalo Courier. Thos. McCabe is



now chief engineer of the Boston. Chas. Fox brought out the Mahoning last year and goes in her this season. Secretary Hager was chief engineer of the Cuba nine years, five years in the old Commercial line and four years for Donaldson Bros. He was chief engineer of the Robert Mills one season, when he left to take the position of engineer for the Buffalo Commercial. A. E. Welch is chief engineer of the City of Rome, and Geo. Fisher is first assistant on the Boston. Thos Ingram has been chief engineer of the Inter Ocean for five years. J. W. Gregory, chief engineer of the Harlem last season, resigned to take the position of chief engineer of the Buffalo Electric Street Railway Company. H. G. Payne is chief engineer of the Crane Manufacturing Company, Buffalo. The number of men ashore enables the association to hold meetings the year around, Saturday nights, at 13½ Swan street. The length of service of these men is a comment on their ability.

Accepted Explanation of the Choctaw Accident.

The bursting of the steam chest cover on the steel steamer Choctaw, while the vessel was on a trip up the lakes above Detroit on Wednesday of last week, was undoubtedly due to the practice of making a narrow joint inside of the bolts in the covering, as explained in detail further on in this article, and then screwing up the bolts to nearly the breaking strain. Immediately following the accident, through which Chief Engineer F. B. Smith of Cleveland was seriously injured, and three other



members of the crew lost their lives, expert engineers from the Cleveland Ship Building Company, builders of the steamer, made a thorough examination of the disabled machinery, and they have since been joined in their investigations by other competent engineers of Cleveland and Detroit, who have fully agreed on the cause of the accident, especially as three or four similar cases, with less disastrous results, have been noted on the lakes. As a result of this investigation, the builders make public the following letter, bearing upon the accident, which was sent this week to representatives of the owners of the vessel:

H. H. Brown & Co., City—

Gentlemen: Our attention has lately been called to a dangerous and faulty practice of making steam chest and cylinder-head joints on lake steamers, which we think it would be to your interest to stop on the engines of your fleet. It consists in using a narrow tape gasket between the flange and face of the cover, inside of the bolts, substantially as shown on the drawings which we send you.

The danger is, that so long as there is a leak through the gaskets, instead of taking off the cover and correcting the fault, those in charge of the engine will simply heave up on the bolts and continue this practice until either the leaks are stopped or the cover is broken. You will readily see by examining the drawings that the narrow tape, which is usually of a hard substance, forms an excellent fulcrum over which to break a cover.

We suggest that you cause your people to use a gasket covering the whole surface of the flange where it is in contact with the cover, on both sides of the bolts as shown in the drawings, which will entirely remove the liability of breaking the cover in this way. In the past animal oils were used in steam cylinders which attacked the studs and bolts, and the engineers sought to save the waste by making the joints inside of the bolts of tapes as described above. Now that mineral oils are used almost exclusively for this purpose, there is no good reason for the continuance of this dangerous practice.

THE CLEVELAND SHIP BUILDING COMPANY.

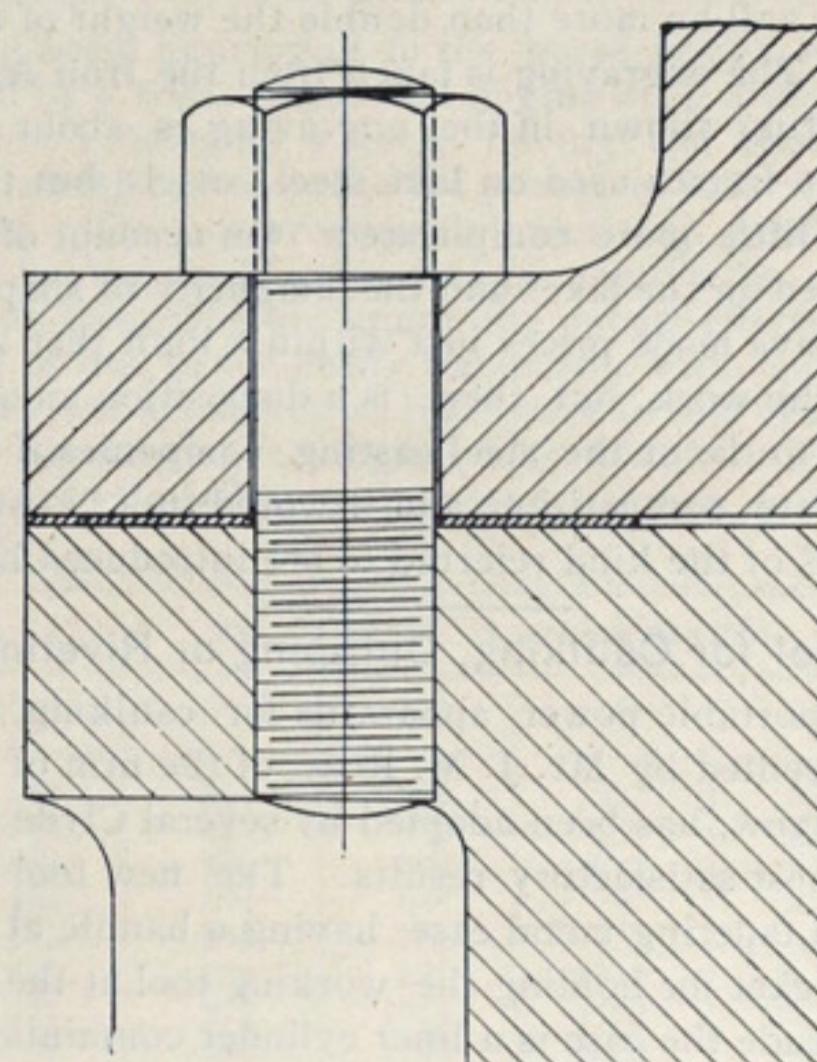
Drawings referred to in the foregoing letter are printed herewith and will be of assistance in discussing the accident. When the machinery was examined after the boat had been tied to the dock of the Frontier Iron Works at Detroit, it was found that the rim of the steam chest cover was broken off at the edge of the gasket next to the bolts, with no bolts broken. The valve

stem was doubled in the shape of a horse shoe, with the valve, which was not broken, keyed onto it, and the stem broken between the link and the steam chest. There was no defect in the casting. The gasket was of what is known as asbestos tape. It was an inch wide by three sixteenths of an inch thick and was put on inside of the bolts. This is a practice followed in some of the shops on the lakes and by a large number of engineers, although not all of them use this particular kind of a gasket. The builders of the boat say they do not permit of this kind of a joint being made in work leaving their shops.

In the steam chest there were thirty-two bolts of $1\frac{1}{8}$ inches full thickness and fifteen-sixteenths of an inch at the bottom of the thread. The tensile strength of these bolts would be about 40,000 pounds to the square inch, and the breaking strain would be 27,600 pounds in each bolt. Suppose the strain on each bolt was one-third of the breaking strain, or 10,000 pounds, (5 tons) it is at once apparent that the strain on the cover must be very great when the gasket is used as a fulcrum. The inside measurement of the steam chest cover, 17x42 inches, or 375 square inches, multiplied by 160, the steam pressure, equals 117,600 pounds, or over 55 tons, pressure. With this pressure added to the strain already put on the bolts, the only wonder is, in looking at the facts, that any steam chest cover will stand such an excessive strain with a gasket put inside of the bolts only, as in this case.

It is apparent that the bending and breaking of the valve stem was caused by the pressure being so suddenly relieved from the back of the valve as it was in the explosion of the chest cover. Running as this steamer was, there would be from 50 to 60 pounds pressure in the receiver between the high and intermediate cylinders, and this would find vent back through the exhaust port of the high pressure cylinder. The area of the exhaust cavity in the valve was 91 square inches, and with 50 pounds pressure behind it, this would exert a force equal to 4,550 pounds, which was more than enough to give momentum to the valve so as to double up the valve stem, which it did. When it is known that the valve stem was bent and had caught on the bottom of the chest, the cause of the break in it, through the downward motion, will be readily understood. The very fact that the valve was not broken, and was keyed to the stem, shows that the breaking of the stem had nothing whatever to do with the explosion.

On account of this method of making a cylinder-head joint being so common, the ship building company, as well as the engineers who have joined in securing an explanation of the accident, are not disposed to in any way blame Mr. Smith, the



engineer, who is recognized as one of the most competent men on the lakes. His theory that the valve stem had broken first and "the steam had used the valve as a hammer to break the steam chest" was, of course, advanced without a knowledge of the condition of the machinery after the accident. The breaking of the water glass column from the explosion of the steam chest, was, as had been understood from the outset, the direct cause contributing most to the loss of life. This water, escaping under a pressure of 160 pounds, would, on being suddenly liberated, almost wholly expand into steam, and as one cubic inch of water will make 1,700 cubic inches of steam, it is fortunate that the results were not even more serious.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company.....	\$100 00	\$ 56 00	\$.....
Champion Iron Company.....	25 00	27 00	.....
Chandler Iron Company.....	25 00	.....	39 00
Jackson Iron Company.....	25 00	.....	75 00
Lake Superior Iron Company.....	25 00	31 00	.....
Minnesota Iron Company.....	100 00	.....	64 50
Pittsburgh & Lake Angelina Iron Co.....	25 00	.....	.....
Republic Iron Company.....	25 00	.....	9 75
Ashland	25 00	.....	.....
Section Thirty-three.....	25 00	1 00	.....
Brotherton.....	25 00	2 00	2 50
Iron Belt.....	25 00	2 40	2 75
Aurora.....	25 00	6 50	7 00

Interest in the market for stocks of the iron mining companies continues on the decline, on account of the very low margin of profit upon which some of the best mines seem destined to struggle in the future. Owners of shares in the older companies are still holding their interests at about the reduced range of prices brought on by the opening of the Mesaba range, but there are few purchasers, and nothing in the struggle over prices of ore with the furnace men to indicate any improvement for the mines in the future. The Chandler company is expected to pay on May 1st the usual dividend of \$1 a share distributed every two months, and the Cleveland-Cliffs company has just paid another of the 1½ per cent. quarterly dividends begun some time ago, but there is no sharing of profits in several companies that have been looked to for some time past for a dividend.

Following are some prices quoted recently on Mesabi stocks, the par value being \$100, excepting the Cincinnati and Lake Superior companies, in which the shares were valued originally at \$25 each: Biwabik \$25.50, Cincinnati 95 cents, Cosmopolitan 20 cents, Clark 75 cents; Great Northern \$9.75. Keystone 50 cents, Kanawha \$1.50, Lake Superior \$3.50, Little Mesabi \$5.00, Lincoln 60 cents, Mountain Iron \$90.00, Minneapolis 40 cents, Mesabi Mountain \$19.00, Shaw \$3.90, Washington 75 cents.

Success with the eight-hour system at the Lake Angelina and other mines is likely to lead to its adoption quite generally in the Lake Superior region.

Around the Lakes.

Monday, April 24, is the date of opening of the Welland canal this year.

J. C. Gilchrist has purchased the schooner S. Watson from the Sandusky Transportation Company for \$12,000.

Soundings at Huron, Lake Erie, show 17 feet 4 inches of water on the outer bar, dropping to 22 feet inside the piers.

David Bell, of Buffalo, has sold the tug Dunbar to the H. M. Loud and Sons Lumber Company of Oscoda for \$1,500 and the Argyle to Edmund Halle of Detroit for \$5,000.

Colin McLachlan is president and general manager, and J. W. Heisner secretary of the McLachlan Transportation Company, just organized at Port Huron. The capital stock is \$125,000, all paid in, and represents the value of the steamer Kittie M. Forbes and the new schooner Mary E. McLachlan.

Capt. W. L. Green of the steamer Fred Pabst was on Lake Michigan during all of the storm of Wednesday and Thursday of last week, and although his vessel delivered 96,000 bushels of corn at Erie without damage to a single bushel of it, he says that a combination of snow, frost and heavy sea made the storm the worst he had ever experienced.

J. H. Gillett, who is well known in connection with harbor towing business at Marquette, will this season manage also the affairs of the Superior Towing and Dredging Company, organized last winter to operate in the vicinity of Superior and Duluth. Mr. Gillett is building dredges for service at the head of the lakes and will send two tugs from Marquette to the head of Lake Superior as soon as the ice will permit.

Capt. E. Day, who is in charge of the new coal and ore docks of the Pittsburg, Shenango & Lake Erie Railway at Conneaut, Lake Erie, says that as a result of dredging that has been going on for several days past, vessels drawing 17 feet can now get to the docks without difficulty. Eleven Brown hoists will be in operation on the docks within two weeks.

Marine Exhibits at the Fair.

WESTERN OFFICE, MARINE REVIEW,
No. 13 Western Union Building, CHICAGO, Ill., April 27.

The exhibits in the marine division of the transportation building have arrived in great numbers during the past week, and Monday's opening will show the most complete collection of vessel models, and the appurtenances thereto, that has ever been brought together. Lieut. A. C. Baker, of the United States navy, who has had the task of bringing samples of marine architecture together, has reason to be justly proud over the result of his labors. From the wooden dug-out of the aborigines and the clumsy junk of the Mongolian to the steel freight and passenger steamers of the present day, and the huge armored battle-ships, which congregated recently at Fortress Monroe, the list is complete. In the size and variety of exhibits, the manufacturers of the United States have fallen behind their European competitors. Among the nations of Europe, England ranks first. The exhibit from this country is very complete. It is practically the same as was shown at the London exhibition in 1890, and contains all the cruisers and battle ships, as well as the merchantmen, and the royal yacht. Against the east wall of the transportation building is built a section of a modern ocean greyhound. This is the exhibit of the International Navigation Company, which controls the steamers Paris and New York. The section is 68 feet long, and is full size, showing everything in detail from the water line to the top of the smokestack, which it includes. The interior will be finished in elegant style.

The exhibit of the Globe Iron Works Company is confined to windlasses, steering gear, and the like. The Chicago Ship Building Company will show models of the steamers that have been turned out of its yard.

From a point of beauty, the showing of the Fall River line of steamers is very fine. In a glass showcase is a large model of the steamer Puritan, the queen of this company's fleet. Accompanying this model are a number of pictures showing the interior of the boat. The work on this model and on the pictures is very faithful.

Members of dredging and dock companies will be interested in the exhibit of William Simons & Co., of Renfrew, Scotland, which was described in the last issue of the REVIEW. Some of the dredges, represented by models in the exhibit of this company, are of enormous size, being nearly as large as the ordinary lake steamer.

The Cunard line has furnished a model nearly six feet long of their new steamer Campania, which just made her trial trip. The workmanship on this model is very elaborate, and the cost is estimated at \$15,000. The fixtures are shown even to the smallest belaying pin and rope.

A list of all the exhibitors in this department would occupy two or three pages of space. United States exhibitors well known on the lakes are: American Steel Barge Company, West Superior, Wis.; American Ship Windlass Company, Providence, R. I.; Bath Iron Works, Bath, Me.; Bethlehem Iron Works, South Bethlehem, Pa.; Chicago Ship Building Company, Colehour, Ill.; Coston Signal Company, New York City; Drein and Sons, Wilmington, Del.; DeGrauw, Aymar & Co., New York City; Detroit Boat Works, Detroit, Mich.; Globe Iron Works Company, Cleveland, O.; Gas Engine and Power Company, Morris Heights, New York City; Harlan & Hollingsworth Company, Wilmington, Del.; David Kahnweiler, New York City; Maryland Steel Company, Sparrows Point, Md.; McBean, Edge & Company, Buffalo, N. Y.; Newport News Ship Building and Dry Dock Company, New York City; Old Colony Steamboat Company, Boston, Mass.; Providence and Stonington Steamship Company, New York City; Safety Car Heating and Lighting Company, New York City; Sintz Gas Engine and Power Company, Grand Rapids, Mich.; Union Iron Works, San Francisco, Cal.; Williamson Bros., Philadelphia, Pa.; Geo. B. Carpenter, Chicago, Ill.

Vessel owners who are looking to Chicago for any improvement in grain freights within the next fortnight are likely to be mistaken. The speculative tendency here is so strong that it seems impossible that the people who are holding the grain will be forced to let go. With every elevator along the river chuck full and with workmen employed night and day in erecting more elevators, boats go begging at a cent a bushel for corn to Buffalo. It is an unhealthy situation, of course, and vessel men may feel sore over the way it has knocked the bottom out of freights, but the game is being played for big stakes, with enormous amounts involved on either side, and there is not likely to be a change for a long time. Lumfler freights are about the same as they were last year with enough loads to keep all the boats which are at work busy. On the lumber market there is not much idea that better figures will be obtained during the early part of the season at least.

Cargo Record Breakers.

The new straight-back steamer Selwyn Eddy's cargo of 139,200 bushels of wheat, delivered at Buffalo from Detroit, entitles her to first place as a grain carrier. The owners will probably not have an opportunity this season to test her capacity for iron ore under conditions similar to those under which the Maritana carried a load of 4,771 net tons. Elevator weights recorded at Buffalo show that the steamer Onoko's cargo of 167,657 bushels, delivered from Chicago last week, also exceeds previous records in this cereal, as the Schlesinger's cargo of last season was considerably short of that of the Onoko.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Chicago Office, Western Union Building, 110 LaSalle Street.
Published every Thursday at No. 516 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

A SHORT time ago, Mr. Henry S. Sill of Worthington & Sill, Buffalo agents of marine insurance companies, created considerable interest in the Harter law relative to bills of lading, signed by the president in February last, by announcing that the New York attorneys of the underwriters represented on the lakes by his firm were of the opinion that section 3 of the act was a radical departure from all existing law relative to the liabilities of vessel owners. The New York Maritime Register also printed recently a lengthy editorial, in which it was held that the act, which has taken the name "Harter act" from the fact that the original bill in Congress was introduced by Mr. Harter, overturned in many ways the established law of the sea. The particular section referred to by Mr. Sill and the New York journal says that "if the owner of any vessel shall exercise due diligence to make the said vessel in all respects seaworthy and properly manned, equipped and supplied, neither the vessel, her owner or owners, agent or charterers shall become or be held responsible for damage or loss resulting from faults or errors in navigation or in the management of said vessel." Since these comments have appeared a copy of the act has been submitted by the REVIEW to two of the best admiralty lawyers on the lakes, and they agree in saying that a careful reading of the law will admit of no such construction being put upon it, as it is a measure of a special nature, the title showing that it relates to "navigation of vessels, bills of lading, and to certain obligations, duties and rights in connection with the carriage of property. The provisions of section 3, they hold, apply to the "certain obligations, duties and rights connected with the carriage of property, and not to the liabilities of the vessel owner in the matter of damages resulting from collisions or other causes, through faults or errors in navigation or in the managemens of his vessel. Furthermore, it is specially provided by section 6 of the act in question that it "shall not be held to modify or repeal sections 4281, 4282 and 4283 of the revised statutes of the United States, or any other statute defining the liability of vessels, their owners or representatives." The sections of the revised statutes referred to by number in the foregoing sentence are the sections which contain provisions limiting the liability of the owner to the value of his vessel.

THE appointment of two supervising inspectors of steam vessels for the lakes seems to be attracting more attention than all of the collectors of customs and other officers to be changed by the government administration. The several aspirants in the Buffalo district are working quietly and in such a way as to cause considerable doubt as to the successful candidate, but as it is very probable that the office in the Detroit district, now held by Capt. Charles Westcott, will not be removed to Chicago, so as to admit of Capt. Cyrus H. Sinclair receiving the appointment, the friends of John H. Galwey, past president of the national organization of marine engineers, are confidently asserting that he will be appointed by the president, notwithstanding the opposition of the vessel interests. They say that he has the active support of Don M. Dickinson and other Michigan politicians who are very close to the administration and who will press the claim that lake vessel interests as a whole are politically opposed to the present powers at the capital and should have no favors to ask at their hands. Again it is in order to suggest, irrespective

of the qualifications of Mr. Galwey or any other candidate for whom such an argument might be presented, that it is high time to remove this service from its political surroundings. President Cleveland during his last administration brought about the International Marine Conference. Will he now have the courage to urge upon Congress the enforcement of some of the very good recommendations for a consolidation of the shipping branches of the treasury department made by the American delegates to the conference?

IN accordance with a suggestion from Governor Flower the New York legislature has passed a bill, which was introduced early in the session, and which carries an appropriation of \$12,000 to be spent on experiments on the use of electric motive power on the state canals. There is only a slight possibility of success resulting from these experiments, but the appropriation is not large and it can be put to good use if properly handled. It might be well to note here that the MARINE REVIEW was the first publication to call attention, three years ago, to the possibilities of successful use of the trolley system on the Erie canal. The suggestion came from W. L. Adams, a young electrical engineer who was then a resident of Buffalo and who is now connected with a large Chicago electrical company. The scheme was discussed in the New York and other eastern daily papers and finally found its way to the legislature through Governor Flower's message of January last.

Capt. Alex. McDougall's Patents.*

TOW BOAT—SPECIFICATION FORMING PART OF LETTERS PATENT
NO. 393,997, DATED DEC. 4, 1888—APPLICATION
FILED APRIL 28, 1888—NO MODEL.

In this specification the inventor refers to letters patent previously granted to him covering the character of boat already described in these articles, and says he has become aware of certain improvements that will better adapt the boat for the carriage of oil, ores, coals, etc. These improvements are thus described:

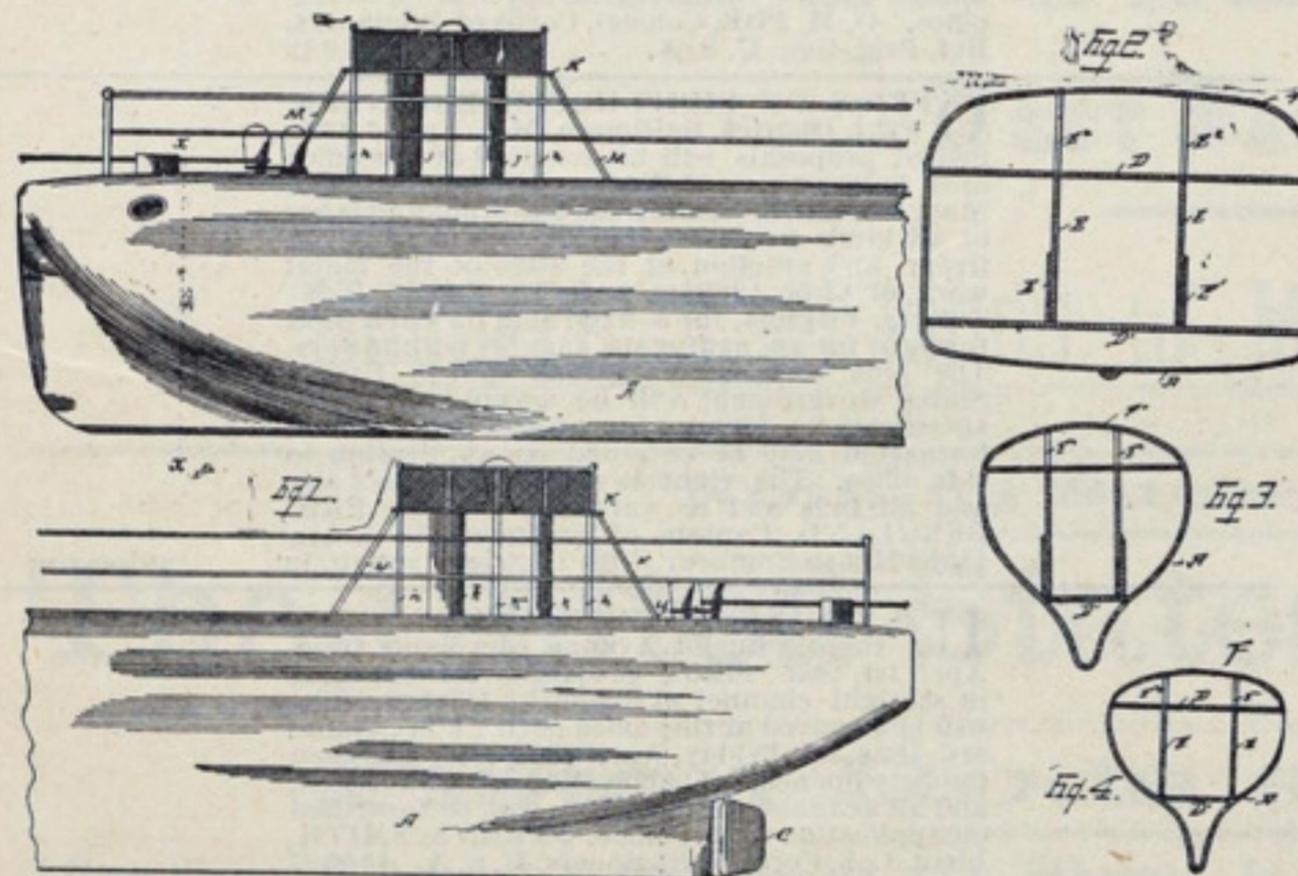
"Fig. 1 is a side elevation of the hull, the center being broken out; Fig. 2, a vertical central cross-section of the hull; Fig. 3, a vertical cross-section of the bow on lines *x x* of Fig. 1; Fig. 4, a similar cross-section at the stern on lines *y y* of Fig. 1; Fig. 5, a vertical longitudinal section of the bow and forward working-deck; Fig. 6, a similar section of the stern and after working-deck; Fig. 7, a detail of construction of the upper deck, and Fig. 8 details of construction of hatch and combings. Similar letters denote corresponding parts of each figure. The hull A, pointed at both ends, designed to be built, preferably, of steel plates secured to steel ribs, each of which is continuous throughout, is for the greater part of its length nearly flat upon the bottom, with rounded corners, vertical sides, and a top, in the shape of a flattened arch, springing from the point of load-line, as shown in the drawings, in this respect differing from the shape of the tow-boats described and illustrated in letters patent previously granted, and assuming more nearly a rectangular form with rounded corners. This form gives a greater carrying capacity with the least draft, a matter of great consequence in shallow waters, while the rounded corners give enough of the arch shape to insure the requisite strength, with a frame and plates as light as possible. The bow, substantially semi-circular at the cross-section *x x* for the upper half of the hull, in the lower half is hollowed out, in this last respect being of a well-known form. The advantage over this form of bow is to prevent burying in waves and to allow the bow to rise and ride easily over such waves. In like manner the stern at the cross-section *y y* is of a similar shape, the purpose being to prevent the stern from sinking too deeply in rough seas. In both bow and stern this form differs from that described and illustrated in my former patents, where the cross-sections in corresponding places have nearly the form of circles, with all lines rounded out and without hollow lines. Upon this hull A there is a skag, B, of such a size as enables me to use a rudder, C, of the usual form

*Under this heading we will publish specifications accompanying letters patent granted to Alexander McDougall since his first application for a patent on the whale-back type of vessel in March, 1880.

of seagoing vessels, and comparatively high and narrow instead of the low and wide one of the former patents, by means of which, owing to the hollow run of the boat, I am enabled to use a rudder that is less liable to be destroyed or injured in bad weather than the kind shown in said former patents.

"In a boat such as I am now describing I prefer to have the width and depth greater in proportion to the length than pointed out in my first patent, viz., about 25 feet in width for a length of 200 feet and a depth of about 20 feet; and I am enabled to make the hull sufficiently strong for the carriage of ores and other heavy material, while dispensing with the cross-beams E of my first patent, by substituting instead heavy main-deck beams D and bulk-heads E, running the whole length or nearly the whole length of the boat, so as to divide the hull into several compartments, (three being shown in the drawings,) said bulk-heads being firmly secured at the top to the main-deck beams and at the bottom to the floor beams D', and having stanchions E² between said main-deck and the upper deck, in line with the bulkheads E. The purpose of these bulk-heads is not to form watertight compartments, to keep the boat afloat if stove in at some part, but to strengthen the hull and keep certain cargoes from shifting position. These bulk-heads are provided with sliding doors E' at intervals conveniently corresponding with the hatchways, adapted to be raised by a tackle operated by the windlass or capstan.

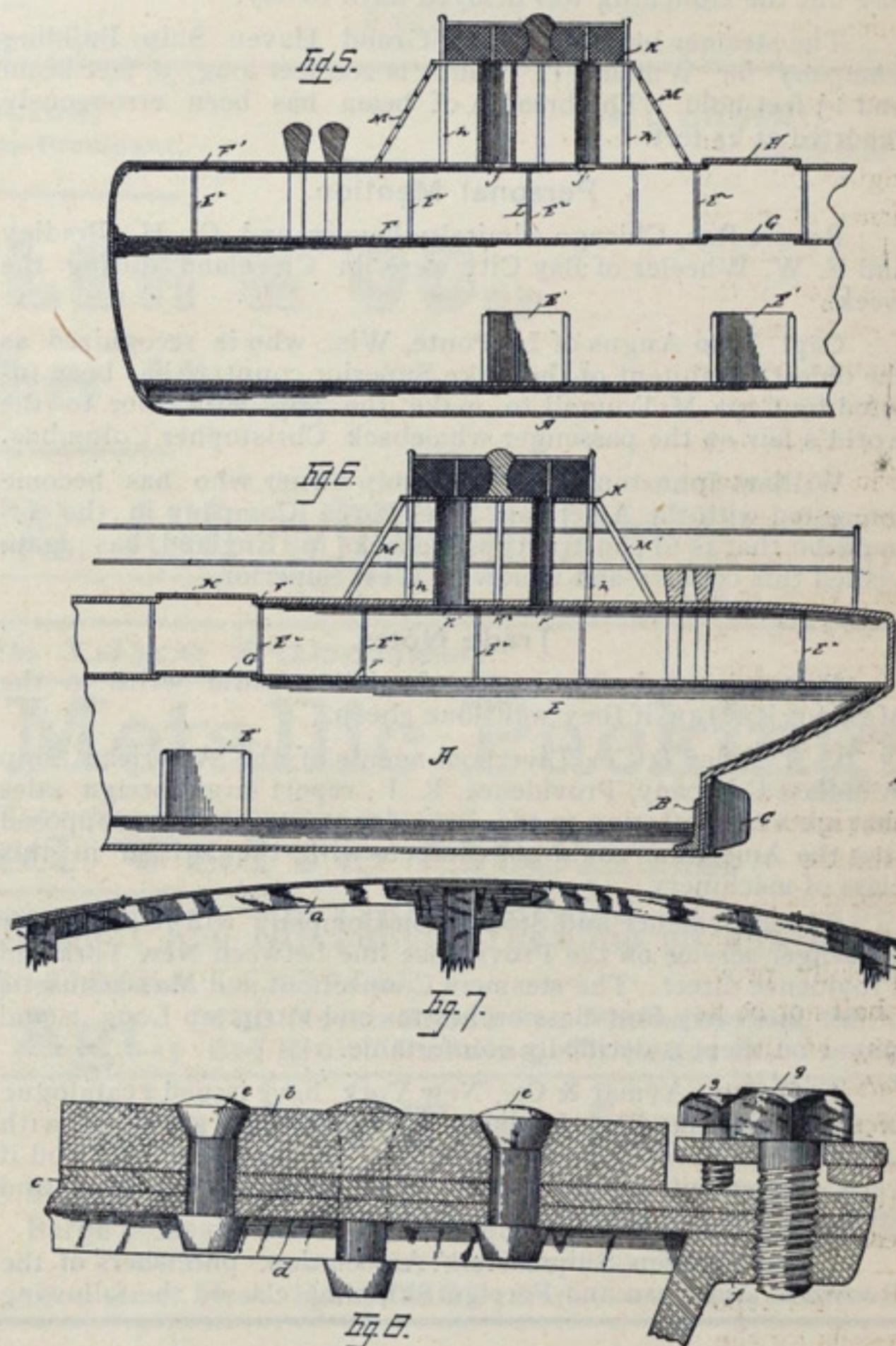
"Upon the main-deck F are numerous hatchways, G, arranged, preferably, along a central line, each hatch being composed, preferably, of a single plate of metal of the proper size. To make good the strength of this deck, weakened by the num-



erous hatchways, a strengthening-plate, a, may be run nearly the whole length of the boat on the under side of the beams and directly below the hatch-combings b, which may be narrow plates running the length of each hatchway or running throughout the length of the entire series. The hatches G preferably hold their places by gravity alone, and are pulled in one direction to open the hatch and in the other to close the hatchways by ropes leading to the windlass or capstan. The hatchways H and H' on the upper deck, F', corresponding in position to those in the main-deck, require more specific mention, as, with regard to them, there is need of excluding water when the hatches are closed. Over the ribs which support this deck are lining-plates c on each side of the hatchways and running the whole length of the boat. Upon this upper deck, F', are hatch-combings d, running on each side of the hatchways the whole length of the series, each combing being preferably a narrow plate. The hatches are maintained in position when the hatchways are closed by numerous screw-bolts e, which pass down through the deck-plates and the lining-plates c. A rubber or other suitable elastic lining, f, is attached to the under side of the hatch near its edges, and the compression of this lining by the screw-bolts e renders all the joints about the hatches water-tight. Four other screw-bolts g—one at each corner of the hatch—pass down through the same and rest at their lower ends upon the deck-plates at the edges of the hatchways. By setting upon these screw-bolts after the screw-bolts e are removed the hatch is raised, so that it rides upon the ends of such screw-bolts g, and the hatch may be moved back or forth to cover or uncover the hatchway without injury to the rubber lining. These movements of the hatches in either direction are conveniently made by the use of the windlass and capstan.

"The bulk-heads, with sliding doors, the particular hatches

and hatchways, and the strengthening of the deck-beams, as just described, are neither described nor illustrated in either of my before-mentioned patents. In my first patent, I described and illustrated working-decks at each end of the boat mounted upon turrets. To avoid the danger of the waves striking such turrets "climbing" over them, I propose to mount my working-decks K K' on numerous pipes, h, properly secured to the deck proper and to the under side of the working deck, and to place in the forward working-deck and in the after part of it a small cylinder, j, to afford a passage to the forecastle L, and another cylinder, j', to carry the shaft to operate the windlass. These decks K and K' are accessible from the main-deck by heavy metal ladders M M', arranged fore and aft, and firmly secured at each end, thereby bracing and supporting said decks very firmly. In the after working-deck K' there are small cylinders in line fore and aft—one, k to give access to the cabin, another, k', for the capstan shaft, and a third, k'', for the chains for the steering-gear. In the loading of this tow-boat the longitudinal bulk-heads prevent the shifting of the cargo in stormy weather, and in the unloading



the doors to the bulk-heads being raised, the entire cargo can be pumped out of the central compartment. In loading ore, the doors being raised, the cargo can be conveniently distributed by hand into the side compartments, and, as such cargo is very heavy and takes but little space, the dropping of the doors upon the loaded cargo will effectively prevent the shifting of it in bad weather. What I claim as new in these improvements is:

"1. The hull for a tow-boat with a central body nearly square in cross-section, with vertical sides and rounded corners, and with sharp ends, semi-cylindrical in the lines of the upper section, and with hollowed-out lines in the lower section thereof, substantially as set forth.

"2. In combination with the hull of a tow-boat, hatchways arranged in series, sliding hatches composed of a single plate of metal, and provided with water-tight packing, screw-bolts to fasten said hatches upon the hatchways, and other screw-bolts to raise said hatches, so that the same may be moved back and forth without injury to the packing."

Ship Yard Notes.

R. W. Linn of Gibraltar, Mich., has just laid the keel for a lumber steamer for the Wolverine Barge Company of Detroit, John J. McLain, president. The boat will be 200 feet long, 37 feet beam and 13 feet hold, and will have fore and aft compound engines, 20 and 40 by 36 inches, to be built by S. F. Hodge & Co. of Detroit. The boiler will be 10½ feet diameter and 15 feet long.

Gilbert N. McMillan, secretary of the Detroit Dry Dock Company, closed a contract a few days ago with J. F. Mathews of Toronto for a single deck steel steamer, 253 feet long, 37 feet beam, and 18 feet deep. The boat will have a triple expansion engine and boiler fitted with Howden's forced draught, and is constructed for general freight business through the Welland canal. She is not to be completed until next April.

The steamer S. S. Curry, illustrated and described in last week's issue of the REVIEW, was to have been put into the water from the yard of F. W. Wheeler & Co., West Bay City, on Tuesday but the launching was delayed until to-day.

The steamer building by the Grand Haven Ship Building Company for William H. Loutit is 200 feet long, 36 feet beam and 13 feet hold. The breadth of beam has been erroneously reported at 25 feet.

Personal Mention.

Robert Rae, Chicago admiralty lawyer, and C. H. Bradley and F. W. Wheeler of Bay City were in Cleveland during the week.

Capt. John Angus of La Ponte, Wis., who is recognized as the oldest inhabitant of the Lake Superior country, has been invited by Capt. McDougall to make the trip with him to the world's fair on the passenger whaleback Christopher Columbus.

William Johnston, the British ship owner who has become interested with the American Steel Barge Company in the corporation that is to construct whalebacks in England, has again visited this country and is now at West Superior.

Trade Notes.

Parties in need of 3 or 5-ton derricks should write to the MARINE REVIEW if they want one cheap.

C. T. Soley & Co., Liverpool agents of the American Ship Windlass Company, Providence, R. I., report large foreign sales that are very flattering to the Providence, as it was supposed that the Americans could not compete with the British in this class of machinery.

The Providence and Stonington Company will resume their passenger service on the Providence line between New York and Providence direct. The steamers Connecticut and Massachusetts of this line carry first-class orchestras and a trip up Long Island sound on them is decidedly comfortable.

DeGraw, Aymar & Co., New York, have issued a catalogue of their ship chandlery business, alphabetically arranged, with indexed cut leaves. Buyers and lake shipbuilders will find it very convenient for reference. The tables of weights and strength which it contains are valuable.

The American Shipmasters' Association, publishers of the Record of American and Foreign Shipping, classed the following

vessels during the past week: Tug B. D. Wood, bark Holliswood and three-masted schooner R. S. Graham, all American; bark Buteshire and schooner Rheidol, British, and half-brig Constante, Mexican.

In describing one of the most powerful passenger locomotives on the London and Southwestern Railway, Engineering says that the piston rods are carried through both covers, are made of steel and packed with United States metallic packing. Managers of some of the largest fleets on the lakes use this packing exclusively.

An advertisement elsewhere in this issue calls for proposals for the construction of a life saving station at Ashtabula Harbor, Lake Erie.

TREASURY DEPARTMENT, UNITED STATES LIFE-SAVING SERVICE, WASHINGTON, D. C., APRIL 25, 1893. Sealed proposals will be received at this office until 2 o'clock p.m., of Wednesday, May 17, 1893, for the construction of a Life-Saving Station at Ashtabula, Ohio. Forms of proposal, together with plans and specifications can be obtained upon application to this office, to the Superintendents of Construction, Life-Saving Stations—No. 24 State Street, New York City, to the Superintendent 9th Life-Saving District, Buffalo, New York, or to the Assistant Inspector, Life-Saving Stations, 9th and 10th Districts, Detroit, Michigan. S. I. KIMBALL, General Superintendent. 27-4

UNITED STATES ENGINEER OFFICE, 34 WEST CONGRESS STREET, DETROIT, MICH., MARCH 18, 1893. Sealed proposals for turbine power plant for the 800-foot lock, St. Mary's Falls Canal, Mich., will be received at this office until 2 p.m., May 2, 1893, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. O. M. POE, Colonel, Corps of Engineers, Bvt. Brig.-Gen. U. S. A. 23-30-6-13

OFFICE OF LIGHT-HOUSE ENGINEER, FIFTH DISTRICT, BALTIMORE, MD., APRIL 7, 1893. Sealed proposals will be received at this office until 2 o'clock p.m., of Wednesday, the 17th day of May, 1893, for furnishing the materials and labor of all kinds necessary for the completion, delivery, and erection at the sites of the metal work of Cape Charles and Hog Island Light Towers, Virginia, for a fixed sum for each light tower or for an aggregate sum for both towers. The bids most advantageous to the United States Government will be accepted. Plans, specifications, forms of proposal, and other information may be obtained on application to this office. The right is reserved to reject any and all bids and to waive any defects. ERIC BERGLAND, Captain of Engineers, U. S. A., Light-House Engineer Fifth District. 13 to 12

U. S. ENGINEER OFFICE, HICKOX BUILDING, 185 EUCLID AVENUE, CLEVELAND, OHIO, APRIL 1ST, 1893. Sealed proposals for dredging in straight channel at Sandusky Harbor, Ohio, will be received at this office until 2 p.m., standard time, of Friday, April 28th, 1893, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. JARED A. SMITH, Lieut.-Col., Corps of Engineers, U. S. A. 13-20-27

UNITED STATES TREASURY DEPARTMENT, STEAMBOAT INSPECTION SERVICE, "THE MALTBY," WASHINGTON, D. C. A Special Meeting of the Board of Supervising Inspectors will be held at Washington, D. C., on May 10th, 1893, to determine and prescribe the lights for "Barges and Canal Boats when in tow of steam-vessels," in accordance with the Act of Congress approved March 3d, 1893.

All persons interested are invited to present their views in writing to the Supervising Inspector-General, Steamboat Inspection Service. "The Maltby," Washington, D. C., also to appear before the Board in person when it meets if they desire to do so.

No other business will be transacted by the Board except that specially referred to in this advertisement. JAS. A. DUMONT, Supervising Inspector-General. 6-13-20-27-4

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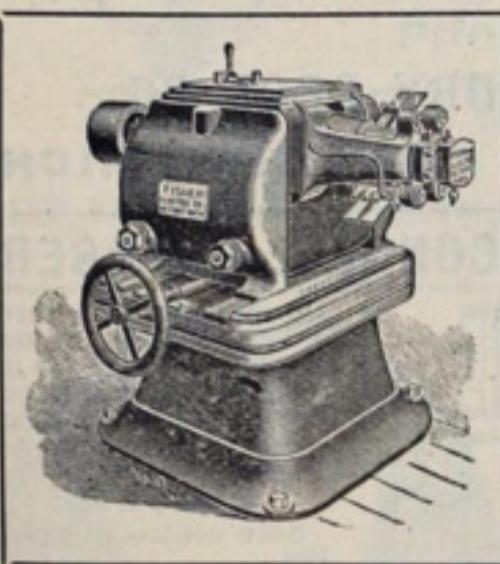
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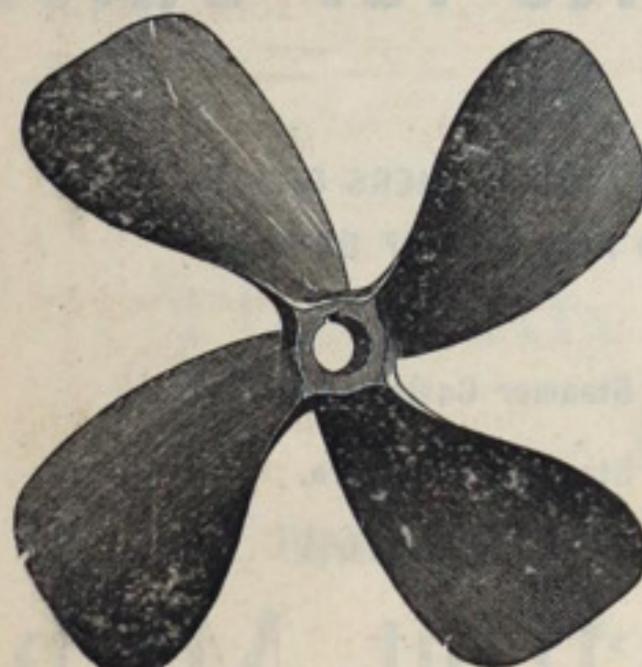
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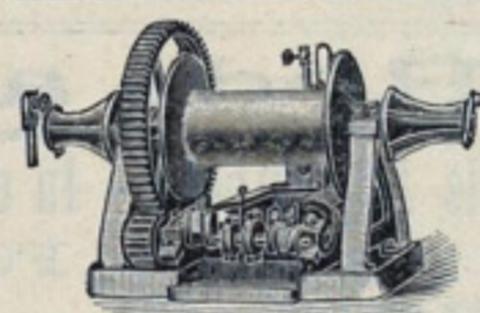
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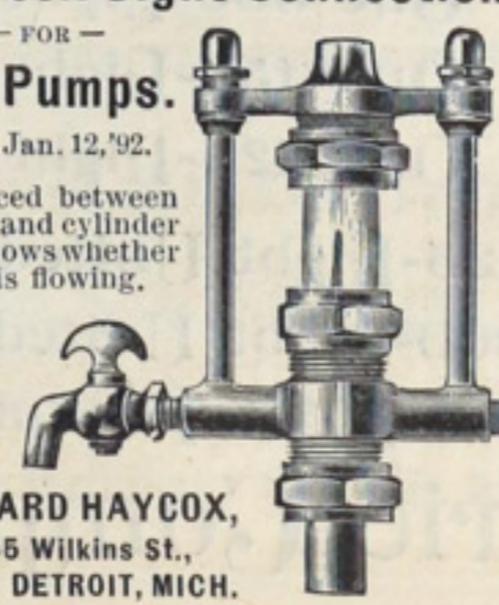
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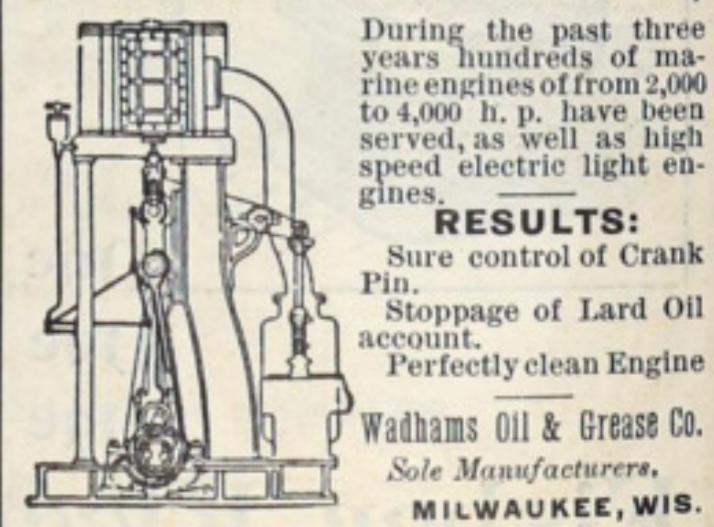
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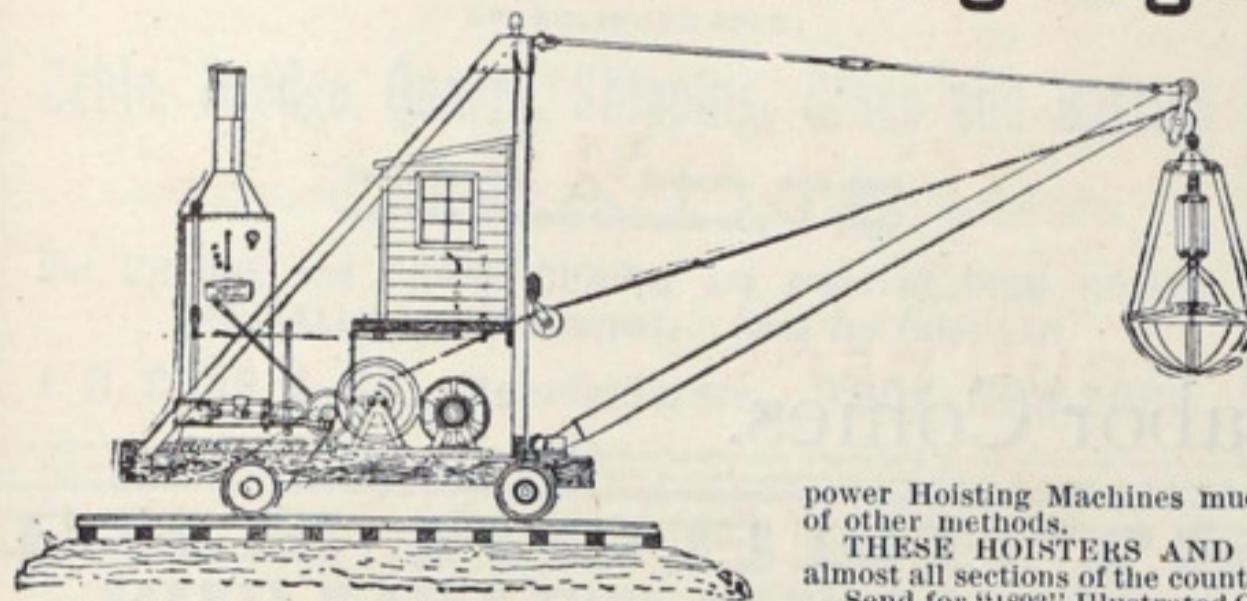


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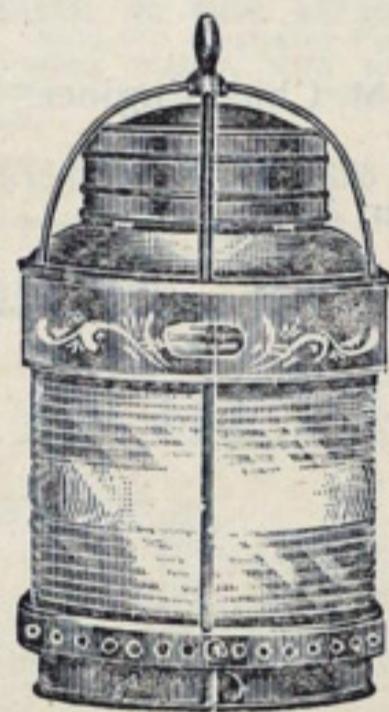
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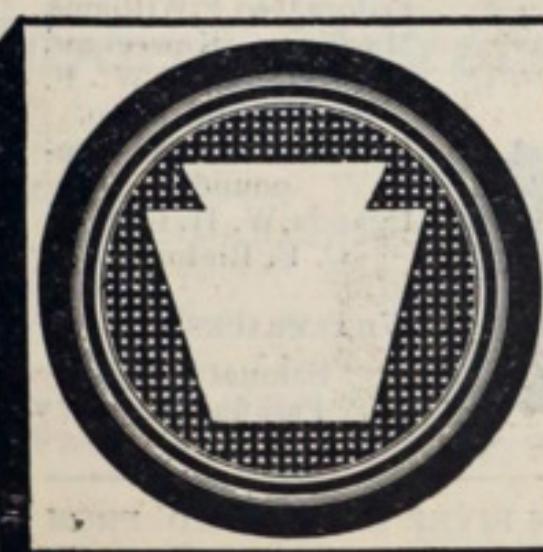
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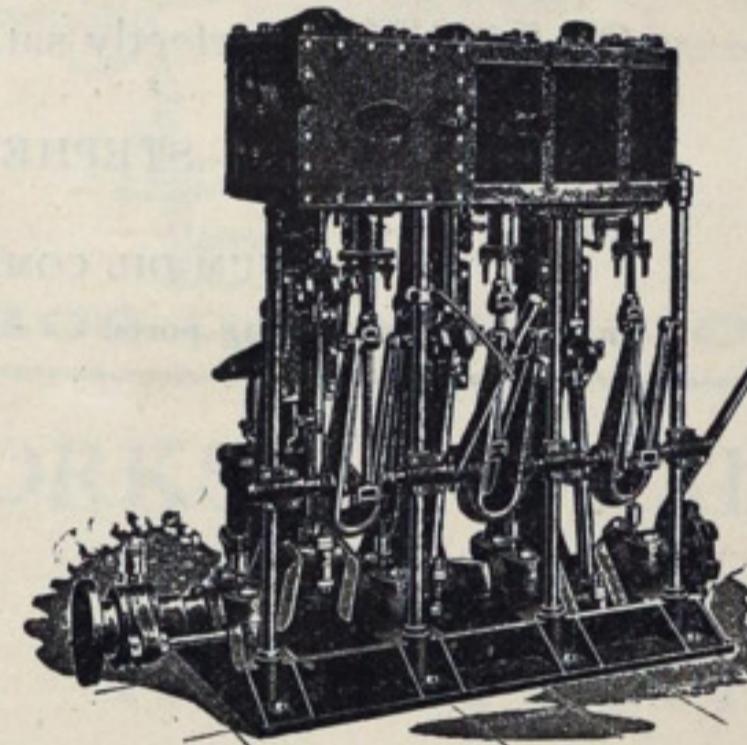
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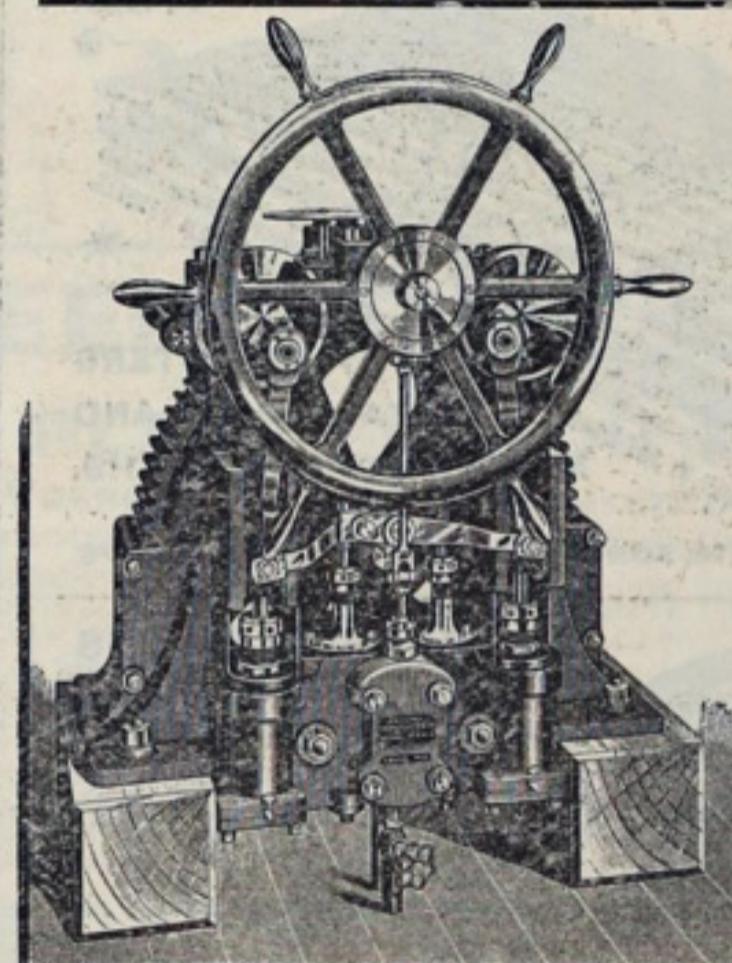


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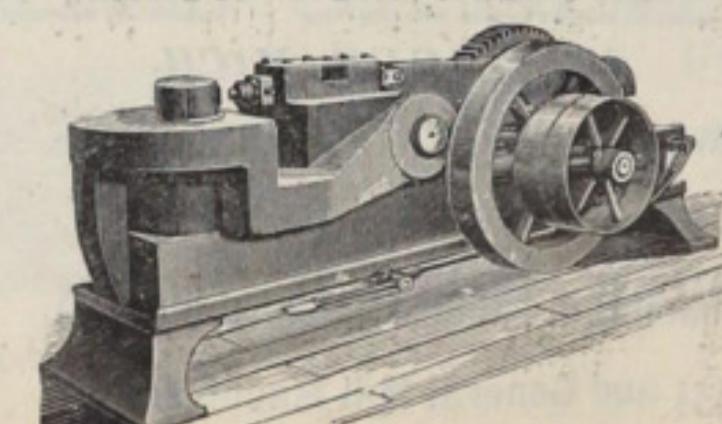
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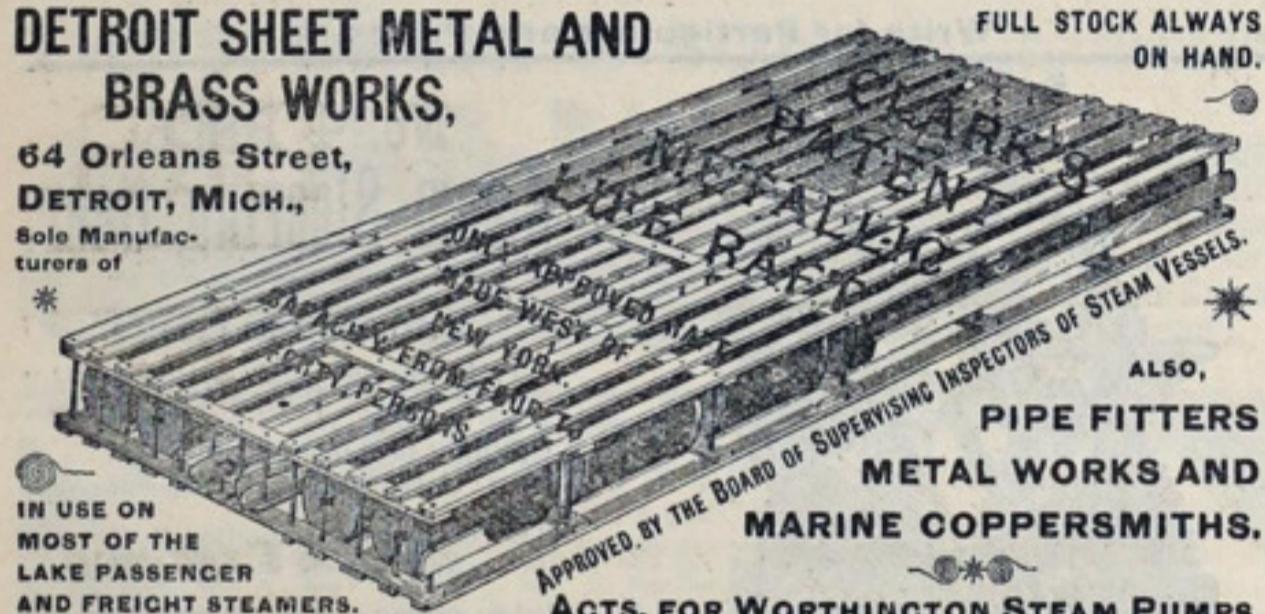
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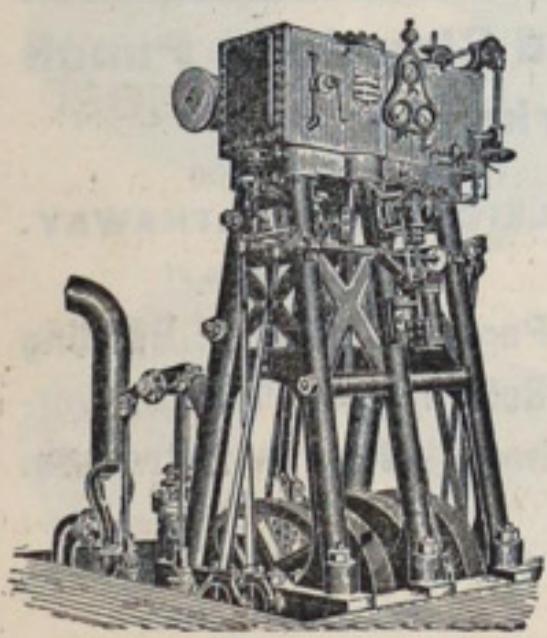
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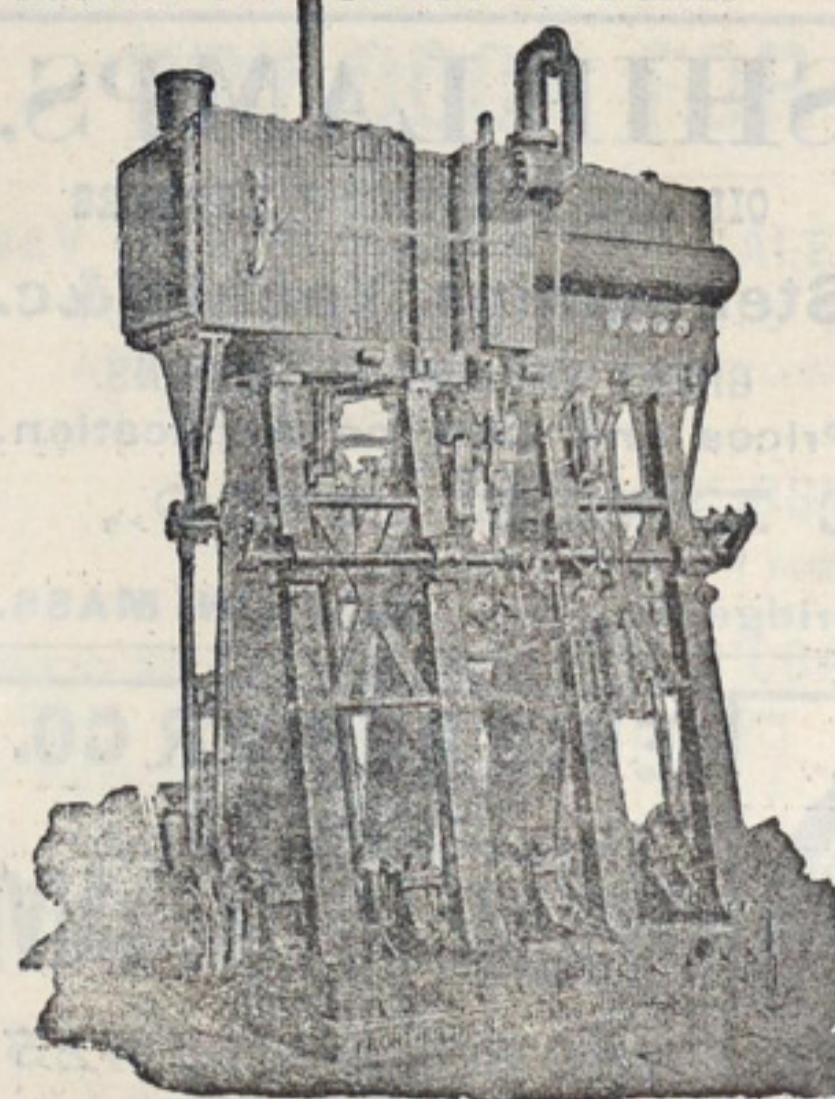
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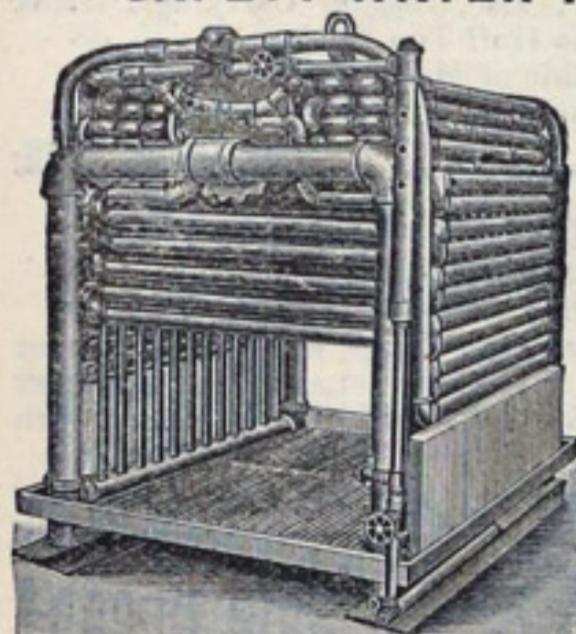
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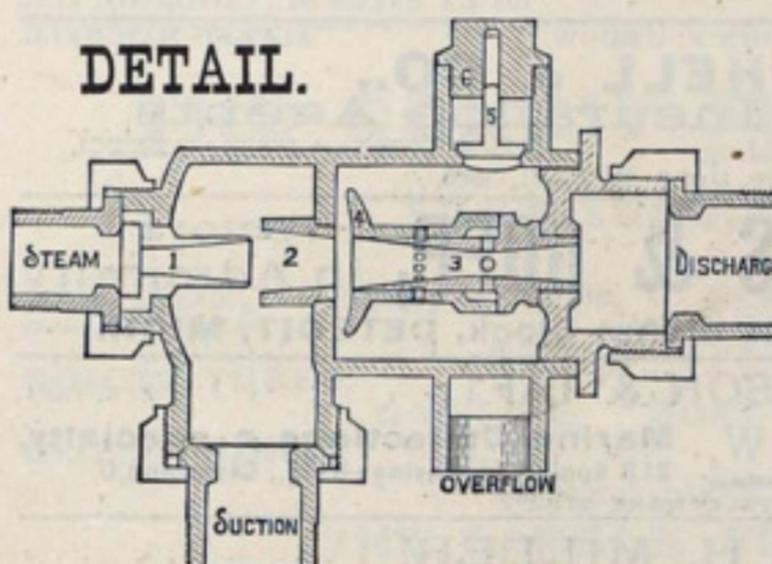
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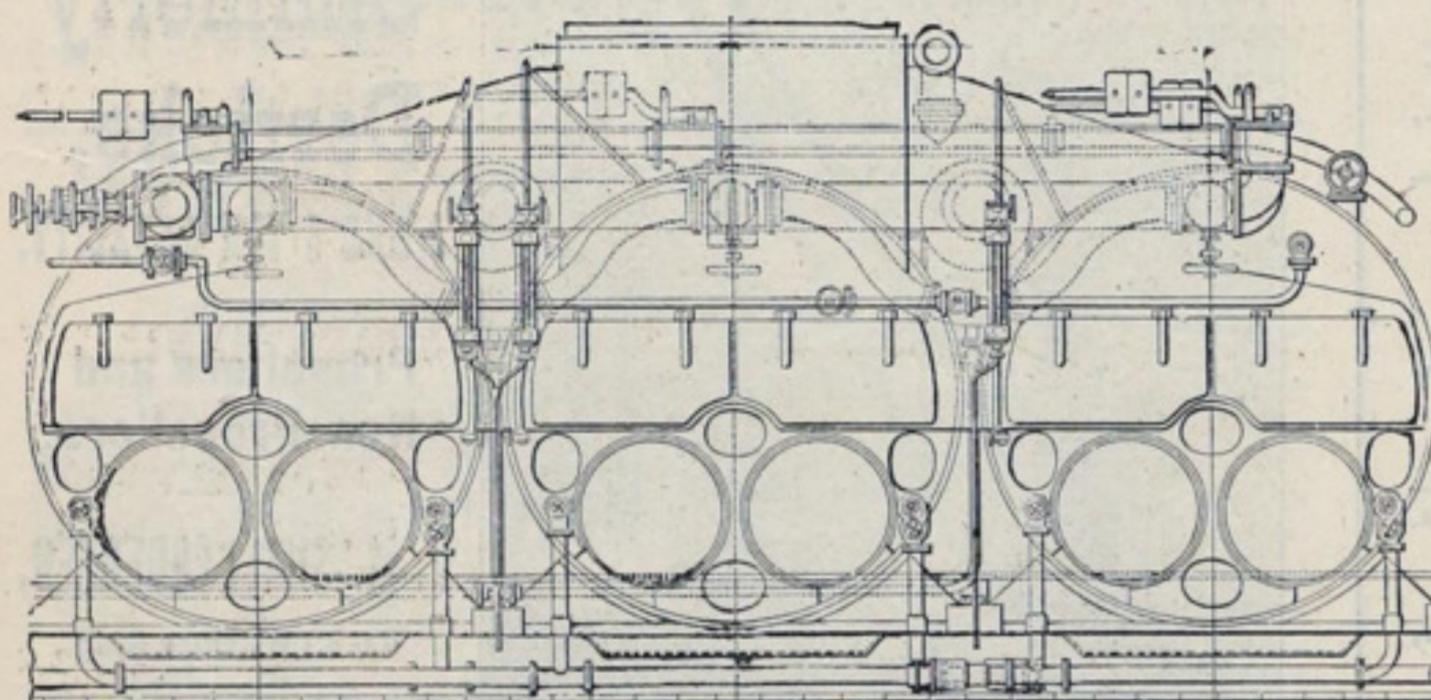
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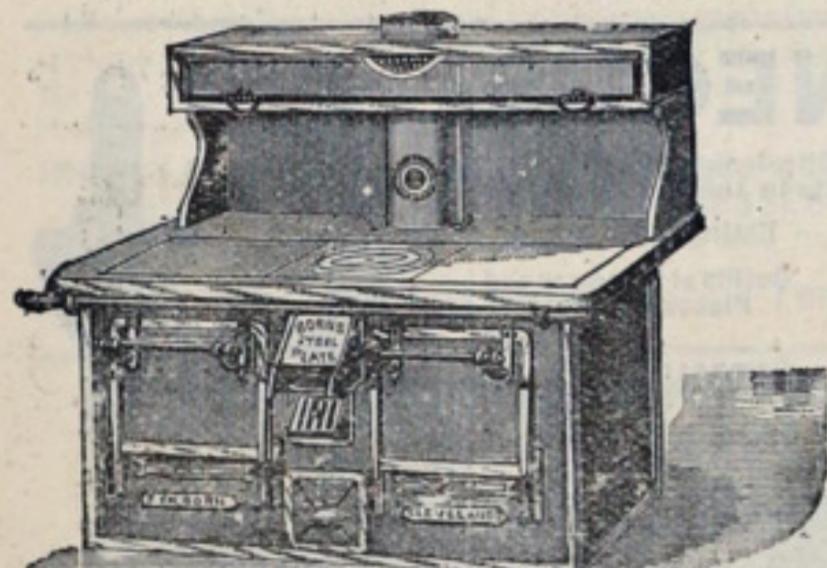
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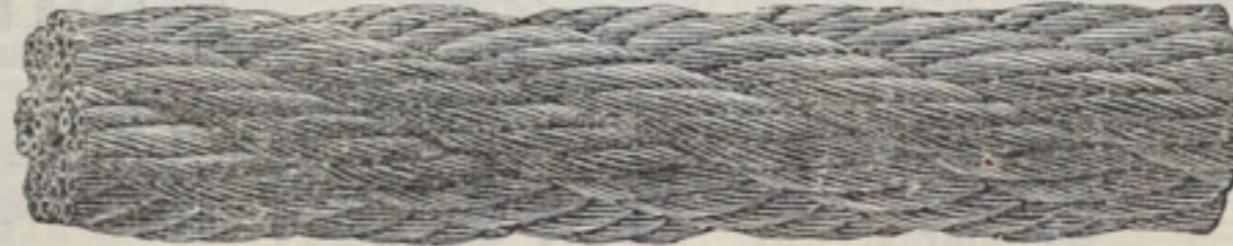
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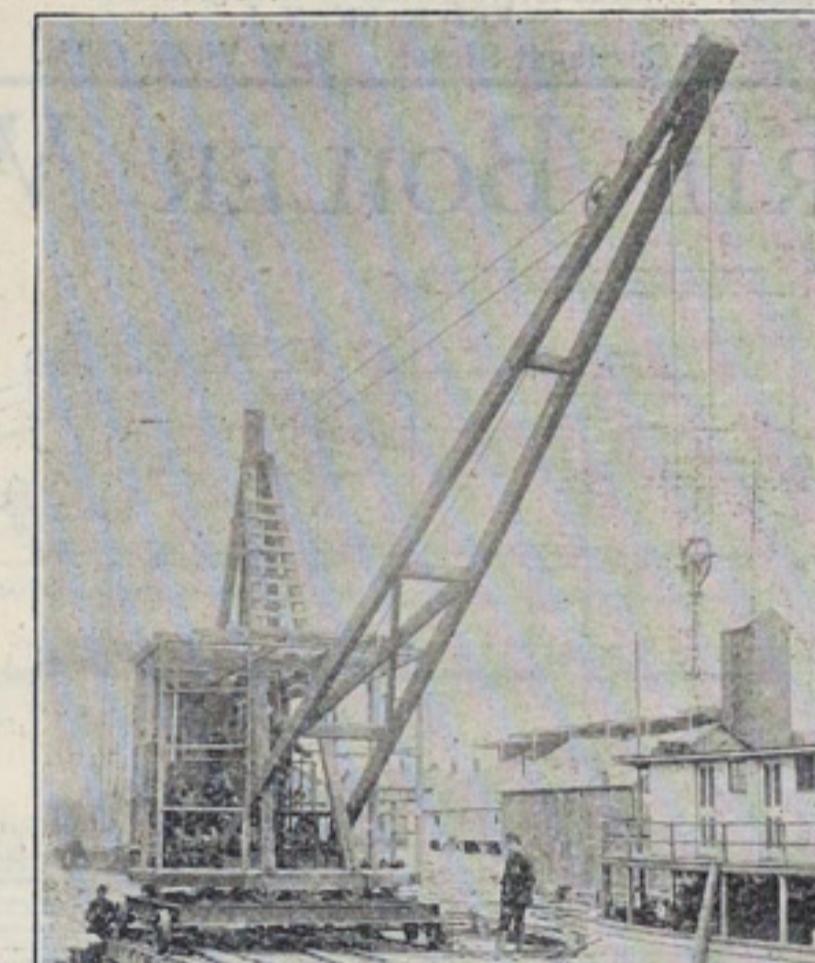
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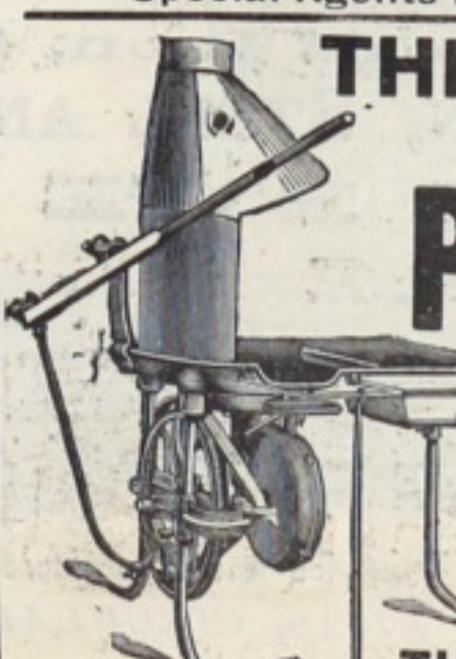
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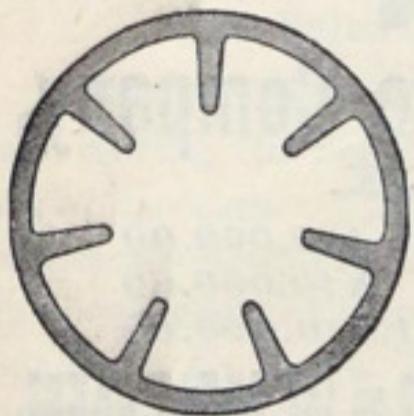
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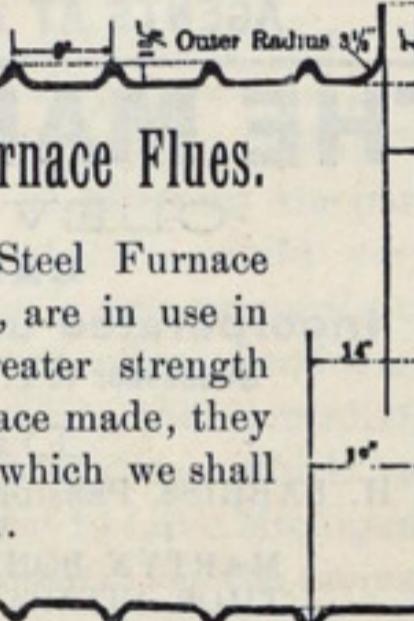
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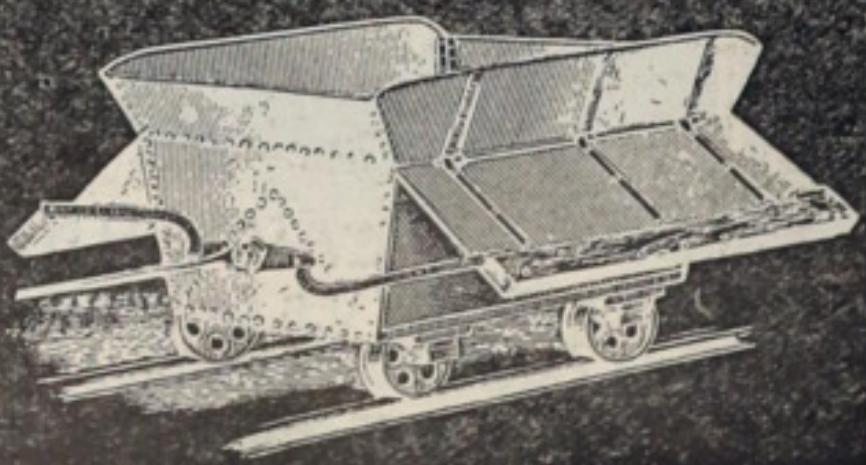
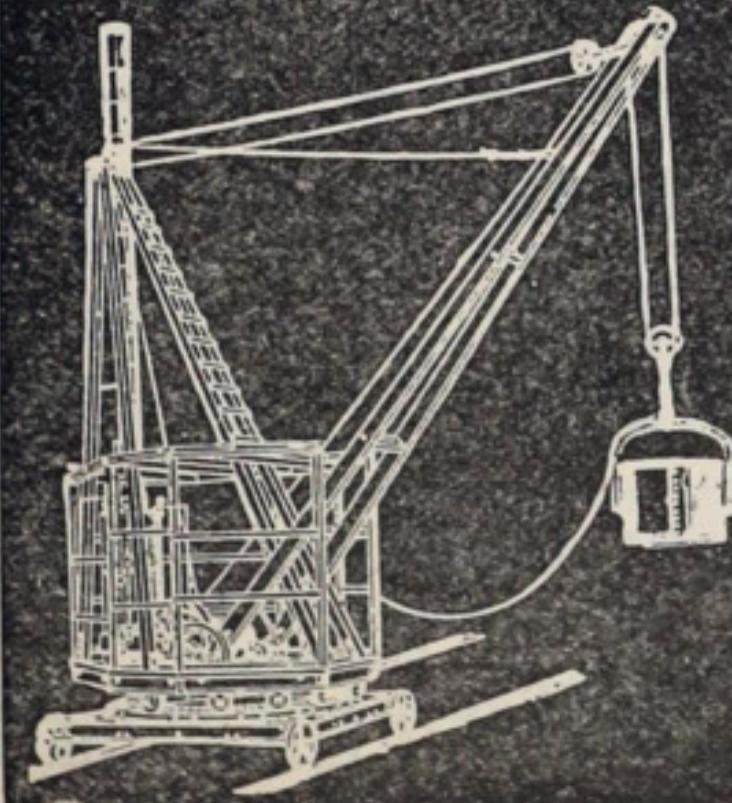
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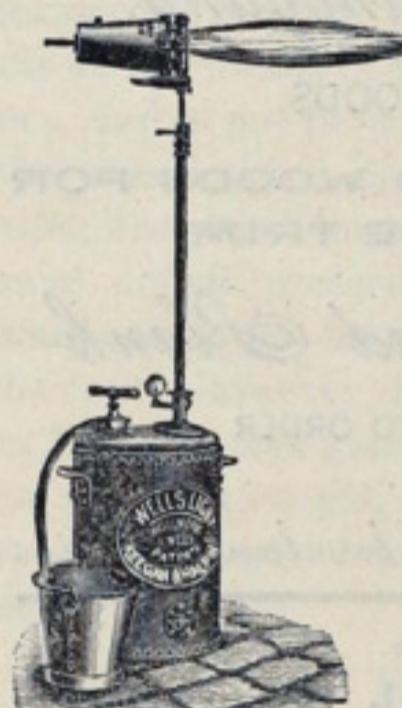
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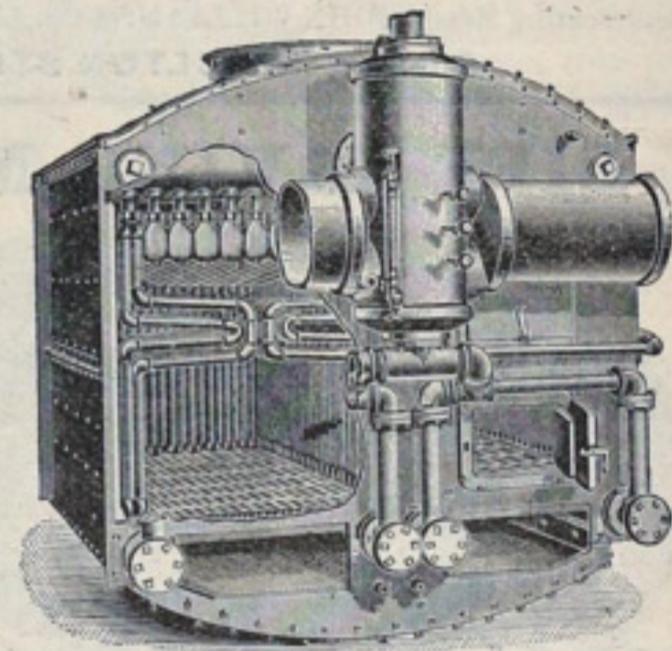
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